Amendments to the Specification:

In the Specification, please replace the paragraph on page 8 beginning at line 16 with the text "The apparatus 10 consists of a first optical path..." with the following replacement paragraph:

The apparatus 10 consists of a first optical path 12 and a second optical path 14; an optical splitter in the form of a non-tuneable Long Period Grating (LPG); an adjustable gain amplifier 21 provided in the second optical path; and an optical combiner in the form of 3dB fixed optical coupler 22 for directing half of the optical signals from each of the first and second paths 12, 14 into an output channel 24.

In the Specification, please replace the paragraph on page 14 beginning at line 14 with the text "The invention is not limited to the precise details..." with the following replacement paragraph:

The invention is not limited to the precise details as described above. For example, the concept may be implemented in integrated optics as opposed to fibre optics; heating element may be used to tune the tuneable coupler; and the optical splitter may be a fixed coupler and an adjustable gain amplifier may be provided in the second path to amplify (with gain greater than or less than 1) to a variable degree, the signal propagating there through.

In the Specification, please replace the paragraph on page 10 beginning at line 14 with the text "The fixed coupler 22 combines the signals propagating..." and ending on page 11 at line 13 with the following replacement paragraph:

The fixed coupler 22 combines the signals propagating through the first and second paths 12, 14. If the coherence length of the ASE source 18 is short, interference effects are negligible. It can

be assumed that both the tuneable and fixed couplers 16, 22 are lossless. Under these assumptions, the power transfer function of the apparatus between ports P_1 and P_2 is:

$$T(\lambda)=(1-K_2)\left[1+K_1\left(\frac{K_2}{1-K_2}T_{co}(\lambda)-1\right)\right],\qquad(1)$$

where K_1 is the power coupling ratio of the tuneable coupler 16. It is assumed that the tuneable coupler 16 is tuneable between 0% and 100% meaning that the tuneable coupler can be tuned to direct 0% of the input signal to the first path and 100% of the input signal to the second path or 100% of the input signal to the first path and 0% of the input signal to the second path. K_2 is the power-coupling ratio of the fixed coupler 22. In this embodiment this is 0.5 (as the fixed coupler 22 is a 3 dB coupler). $T_{co}(\lambda)$ is the transmission spectrum of the LPG 20 for core-to-core propagation and is given by the following expression[7-9]

$$T_{co}(\lambda)=\cos^2(\gamma L)+\frac{\delta^2}{\gamma^2}\sin^2(\gamma L),\qquad(2)$$

where L is the length and Λ is the period of the LPG 20, κ is the coupling coefficient, $\delta=\left(\pi/\Lambda\right)\left(\frac{\lambda-\lambda_0}{\lambda}\right)$ is the normalized frequency which indicates the deviation from synchronism, and $\gamma=\left(\kappa^2+\delta^2\right)^{1/2}$.